Attachment B

Electricity Demand Growth in V.2.1.6

Electric Load Growth

The electricity sales forecast in the U.S. Energy Information Administration's *Annual Energy Outlook 2003 with Projections to 2025* (AEO 2003) provided the starting point for the electric load growth assumptions used in v.2.1.6. AEO 2003 projects electricity consumption to grow at an average annual rate of 1.86% in the period 2000 through 2020. As was done in v.2.1[1], calculations were performed to account for the documented and projected reductions in consumption due to a series of voluntary programs operated by both the U.S. Department of Energy and EPA, collectively known as the Climate Change Action Plan, or CCAP.

The AEO 2003 electricity sales projections do not fully reflect these energy efficiency reductions. However, there is a degree of uncertainty about the extent to which the AEO 2003 electricity sales projections capture the energy efficiency electricity reductions. To bound this uncertainty, estimates were made of the electricity growth rate assuming "High" and "Low" accounting for CCAP efficiency improvements in the electricity sales projections. The "High" case implied that the AEO 2003 electricity sales growth projections already include a high level of the CCAP reductions and, therefore, only limited compensating downward adjustments were needed to fully account for the impact of the voluntary programs. The "Low" case implied the opposite, i.e., the AEO 2003 sales growth projections include a low degree of the actual CCAP reductions, so must be lowered to a greater extent to reflect the full extent of actual efficiency improvements.

The conclusions from this analysis were that if AEO 2003 projections already capture a high degree of CCAP reductions, then the actual average annual electricity growth rate would be 1.67% instead of 1.86%, whereas if AEO captures a low degree of the efficiency improvements, then the growth rate would be 1.40% instead of 1.86%. Based on this analysis, it was determined that an average annual growth rate of 1.55% was a reasonable estimate of electricity sales after taking full account of the efficiencies achieved as a result of the DOE and EPA programs. Data from a February 2003 EIA model run confirmed the choice of this growth rate, yielding a point estimate of 1.57% for the average annual electricity growth rate. (Note: In v.2.1 the comparable growth rate was found to be 1.25%.) The following attached worksheet shows calculations that were performed to estimate the final growth rate. Note that estimates were obtained for 2010 and 2020. Linear interpolation was used for intervening years.

This electricity sales projection was then translated into net energy for load for use in IPM by multiplying the electricity sales by the ratio of net energy for load to total sales as found in AEO 2003. The resulting net energy for load values that were incorporated in v.2.1.6 are shown in the table below.

Year	Net Energy for Load[2] in v.2.1.6 (Billions of kWh)
2005	3,865
2010	4,158
2015	4,474
2020	4,825

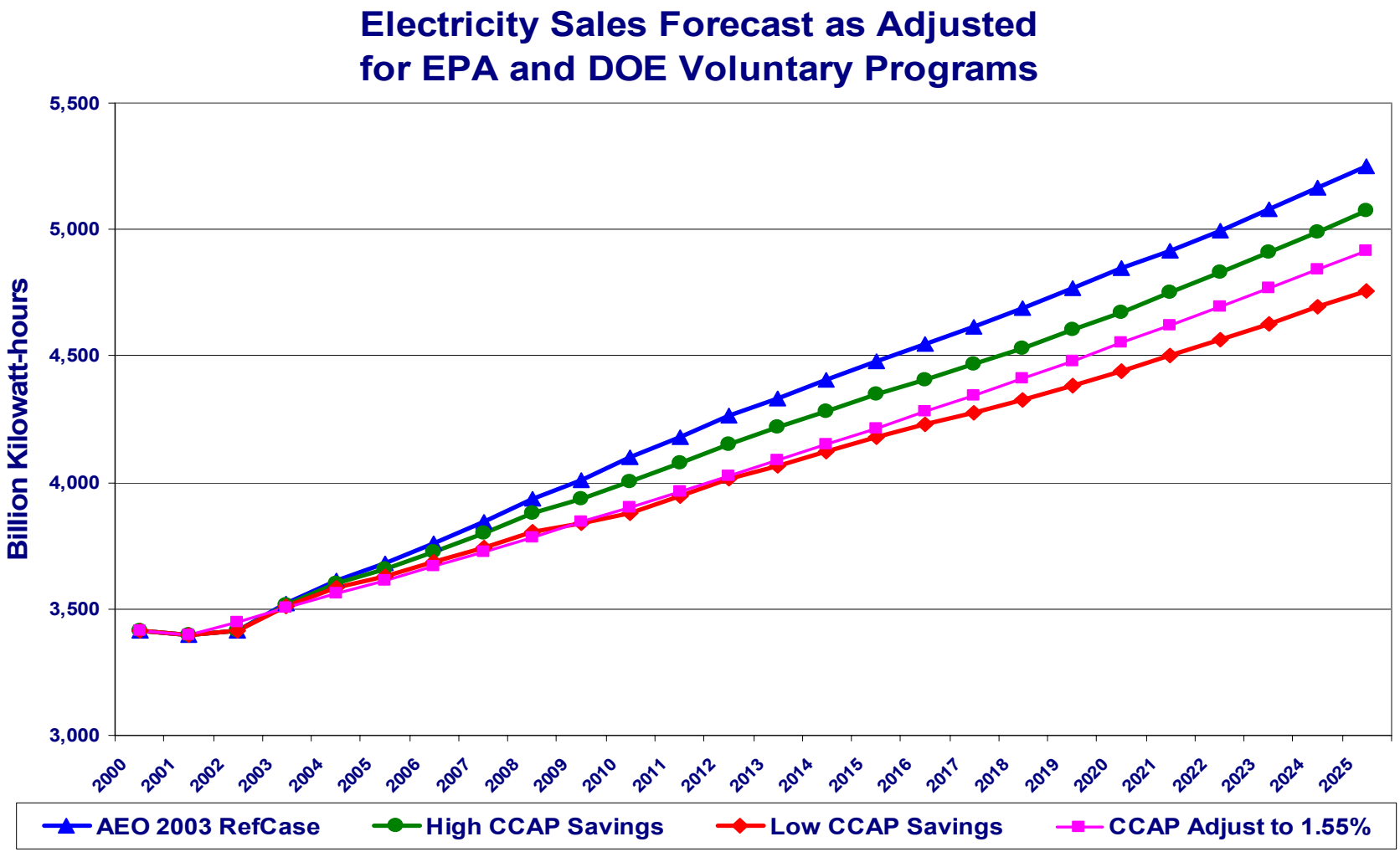
Notes

[1]See sections 3.2.1 and 3.2.2 in "Documentation of EPA Modeling Applications (V.2.1) Using the Integrated Planning Model" at www.epa.gov/airmarkets/epa-ipm.

[2]For specific runs built upon IPM Base Case 2000, the total national net energy for load resulting from the run may differ slightly from the assumptions shown in Table 3.2 due to the exports of electricity, imports, and computational rounding.

Key Data for EPA Base Case v.2.1.6 Electricity Forecast

	2000	2005	2010	2015	2020	AAGR 2001-2020
GDP AEO2003 (Bln $1996)	9,191	10,361	12,258	14,288	16,450	
Electricity Sales (Billion kWh)						
AEO2003 - Lower 48 (Table 73)	3,415	3,681	4,097	4,477	4,846	
IPM Initial RefCase without CCAP	3,415	3,681	4,097	4,477	4,846	1.86%
IPM w/CCAPat HighEIA Estimates	3,415	3,657	4,001	4,347	4,672	1.67%
IPM w/CCAP at EIA Feb 02 Estimates	3,415	3,632	3,899	4,241	4,565	1.57%
IPM w/CCAP GrowthAdjust to 1.55%	3,415	3,614	3,902	4,214	4,551	1.55%
IPM w/CCAP at Low EIA Estimates	3,415	3,631	3,880	4,177	4,440	1.40%
Differential relative to Reference Case						
Delta High CCAP Estimates	0	24	96	131	174	
Delta Mid CCAP Estimates 02-04-03	0	48	198	237	280	
Delta Low CCAP Estimates	0	49	218	300	406	
Non-Included CCAP Savings (Bln kWh)						
Net of High AEO2003 Estimates	0	64	137	171	214	
Net of Mid AEO2003 Estimates	0	150	300	338	382	
Net of Low AEO2003 Estimates	0	124	293	375	481	


Electricity Sales Forecast as Adjusted for EPA and DOE Voluntary Programs
Billion Kilowatt-hours
5,500
5,000
4,500
4,000
3,500
3,000
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
AEO 2003 RefCase
High CCAP Savings
Low CCAP Savings
CCAP Adjust to 1.55%